MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

BKC2024 – DATABASE MANAGEMENT SYSTEMS

(All Sections / Groups)

27 OCTOBER 2018
2:30 P.M. – 4:30 P.M.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This Question paper consists of 4 pages with 4 Questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

QUESTION 1

a) Explain **FIVE (5)** database management systems (DBMS) functions. (10 marks)

b) Consider the following scenario:

An ITEM table consists of an attribute called QTY. Assume that there is an item with the current QTY value of 35. Also assume that there are two concurrent transactions, T1: Purchase 100 units and T2: Sell 30 units.

TIME	TRANSACTION	STEP	STORED VALUE
1	T1	Read QTY	35
2	T1	QTY = 35 + 100	
3	T1	Write QTY	135
4	T2	Read QTY	135
5	T2	QTY = 135 - 30	
6	T1	****ROLLBACK****	35
7	T2	Write QTY	105

Note:
Computation for:
T1: QTY = QTY + 100
T2: QTY = QTY - 30

i) Briefly describe concurrency control. (2 marks)

ii) What type of problem is happening in the above scenario? Explain the situation that led to this problem. (3 marks)

iii) Explain **THREE (3)** types of concurrency control to prevent the above problem. (6 marks)

c) List the steps performed in conceptual design stage of the database life cycle. (4 marks)

(Total: 25 marks)

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QUESTION 2

a) In 1985, Codd published a list of 12 rules which actually are a set of 13 rules (numbered zero to twelve) to define a relational database system. Select and discuss **FOUR (4)** of the rules defined by Codd. (8 marks)

b) Explain and contrast **FOUR (4)** activities performed by a data administrator and **FOUR (4)** activities by a database administrator. (8 marks)

c) Identify and discuss with an example each **THREE (3)** disadvantages of Distributed Database Management Systems. (9 marks)

(Total: 25 marks)

QUESTION 3

Based on the following tables, write appropriate SQL statements to carry out the following tasks:

CAKE

CAKE_CODE	CAKE_FLAVOUR	WEIGHT	PRICE	BAKER_ID
1000	Banana Chocolate Cake	20	90	B8010
2000	Cheese Cake	10	80	B8050
3000	Almond Cake	5	65	B8030
4000	Tiramisu Cake	5	40	B8010

BAKER

BAKER_ID	BAKER_NAME	CONTACT_NO
B8010	Tim Lee	016-771 1234
B8030	Tom Lim	017-435 9107
B8050	Tam Tan	019-890 4586

a) Create the CAKE table, using the following table definition: (7 marks)

Field Name	Data Type	Size	Remarks
CAKE_CODE	Number	-	Primary key
CAKE_FLAVOUR	Short Text	30	Required
WEIGHT	Number	-	-
PRICE	Number	-	-
BAKER_ID	Short Text	5	-

Continued...

b) Alter the size of the CAKE_FLAVOUR field from the current 30 characters to 40 characters. (2 marks)

c) Add the following record into the BAKER table. (2 marks)

BAKER_ID	BAKER_NAME	CONTACT_NO
B8080	Tum Sim	012-382 9001

d) Update the CONTACT_NO of BAKER_ID: B8010 to 010-771 4500. (3 marks)

e) Select all the details of cakes that do NOT weigh at 5kg. (2 marks)

f) Display the value of the average cake PRICE. (1 mark)

g) Display the CAKE_FLAVOUR, BAKER_NAME and CONTACT_NO where the cake PRICE is above RM 60. (4 marks)

h) List the CAKE_FLAVOUR and PRICE for all cakes that WEIGHT are below 20. Sort the result so that those with the highest PRICE are listed first. (4 marks)

(Total: 25 marks)

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QUESTION 4

a) Create a basic **Crow's Foot entity relationship diagram (ERD)** showing the entities, attributes, relationships and connectivities based on the business rules below. (5 marks)

At Pintar University, each course may have one or more other courses as prerequisites, or may have no prerequisites. The attributes of a COURSE includes COURSE_CODE and COURSE_NAME.

b) Consider the following reservation form of Speedy Car Rental & Limousine:

SPEEDY CAR RENTAL & LIMOUSINE
RESERVATION FORM

RESERVATION NO.: RES/180921 RESERVATION DATE: 21 SEP 2018

CLIENT NO.: CUS/180921
CLIENT NAME: METAMIX STEEL
CLIENT CONTACT: 06-256 3421
CLIENT ADDRESS: 584-Q, LORONG HAJI SAID, BUKIT BARU, 75450 MELAKA.

VEHICLE DETAILS:

VEHICLE NO.	VEHICLE TYPE	NO. OF PASSENGER	DEPARTURE	RETURN	DRIVER NO.	DRIVER NAME	DRIVER CONTACT
MCX 1010	CAR	3	22-OCT-2018	24-OCT-2018	D-7856	ALLEN	017-7122 5698
MCD2468	MPV	6	29-OCT-2012	30-OCT-2012	D1002	ALI	014-890 7230

Derive the above relations in unnormalized form (UNF), and normalize it from UNF to third normal form (3NF). Show all steps taken to normalize the relations and clearly state any assumptions made (if necessary). (11 marks)

c) Based on the set of 3NF relations derived in (b), draw a complete ERD using **Chen notation**. Make sure that all the entities, attributes, relationships and connectivities are included in your ERD. (9 marks)

(Total: 25 marks)

End of Paper